

## CLAIMS:

1. Method for coding a stream of M input words using a channel code, comprising the steps of
  - selecting a frame sync extension from a group of frame sync extensions
  - pre-coding the stream of M input words into a stream of pre-coded input words
- 5 – coding the stream of pre-coded input words into a stream of groups of N code words using a coder
  - inserting a frame sync body directly in a fixed length frame in the stream of groups of N code words
  - arranging for a group of code words representing the frame sync extension in the stream of
- 10 groups of N code words directly adjacent to the inserted frame sync body where, after a further NRZI coding, a disparity of the frame sync body is balanced by a disparity of the group of code words representing the frame sync extension, characterized in that a length of the group of code words representing the frame sync extension is variable.
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2. Method as claimed in claim 1, characterized in that the coder is a 17PP coder
3. Method as claimed in claim 1,
- 20 characterized in that the coder is an EFM coder
4. Method as claimed in claim 1, characterized in that the coder is an EFM+ coder
- 25 5. Method as claimed in claim 1, 2, 3 or 4, characterized in that the step of arranging for the group of code words representing the frame sync extension in the stream of groups of N code words comprises the step of inserting a frame sync balancing input word into the stream pre-coded input words.

6. Method as claimed in claim 1, 2, 3 or 4  
characterized in that the step of arranging for the group of code words representing the frame sync extension in the stream of groups of N code words comprises the step of inserting a code word representing the frame sync extension into the stream of groups of N code words

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7. Method as claimed in claim 6,  
characterized in that the group of code words representing the frame sync extension in the stream of groups of N code words is chosen from the following table:

	Frame Sync extension
10	FS0 000 001 000 001 001 000
	FS1 010 010 001 000 001 001
	FS2 101 000 001 000 101 000
	FS3 100 001 000 010 001 001
	FS4 000 100 010 100 001 001
15	FS5 001 001 001 000 101 001
	FS6 010 000 001 000 010 010
	FS7 100 101
	FS8 101 010

20 8. Method as claimed in claim 5,  
characterized in that a first sub group of code words representing a first section of the frame sync extension in the stream is chosen from the following table:

	first section of frame sync extension
	FS0 000 001
25	FS1 010 010
	FS2 101 000
	FS3 100 001
	FS4 000 100
	FS5 001 001
30	FS6 010 000
	FS7 100 101
	FS8 101 010

and that a frame sync balancing input word is chosen from the following table:

frame sync balancing input word

FS0	11 10 10 11
FS1	10 11 10 10
FS2	10 11 11 11
FS3	11 01 10 10
5 FS4	00 11 10 10
FS5	10 11 11 10
FS6	10 11 01 01
FS7	none
FS8	none

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9. Record carrier for storing a stream comprising code words derived from input words using a channel code and further comprising a frame sync comprising a frame sync extension, the frame sync extension comprising a frame sync identification and a frame sync balancing word where a disparity of the frame sync is zero,  
 15 characterized in that a length of the frame sync extension is variable.

10. Record carrier as claimed in claim 9,  
 characterized in that the channel code is a 17PP code

20 11. Record carrier as claimed in claim 9,  
 characterized in that the channel code is an EFM code.

12. Record carrier as claimed in claim 9,  
 characterized in that the channel code is an EFM+ code.

25 13. Method as claimed in claim 9, 10, 11 or 12,  
 characterized in that the group of code words representing the frame sync extension in the stream is chosen from the following table:

Frame Sync extension	
30 FS0	000 001 000 001 001 000
FS1	010 010 001 000 001 001
FS2	101 000 001 000 101 000
FS3	100 001 000 010 001 001
FS4	000 100 010 100 001 001

FS5	001 001 001 000 101 001
FS6	010 000 001 000 010 010
FS7	100 101
FS8	101 010

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14. Apparatus for storing data on a recording medium comprising an encoder with an output connected to an input of a frame sync insertion means where the encoder is arranged for coding the stream of input words into a stream of code words and the insertion means is arranged for inserting a group of code words representing a frame sync body into the stream of code words, where the encoder is arranged to control an RDS of the code words and where the insertion means is arranged to insert a group of code words representing a frame sync extension with a frame sync extension disparity into the stream adjacent to the code words representing the frame sync body, where the frame sync extension disparity is chosen to cancel a disparity of the group of code words representing the frame sync body, characterized in that a length of the group of code words representing the frame sync extension is variable.

15. Apparatus for storing data on a recording medium comprising an encoder with an input and with an output connected to an input of a frame sync insertion means where the encoder is arranged for coding the stream of input words into a stream of code words and the insertion means is arranged for inserting a group of code words representing a frame sync body into the stream of code words, where the encoder is arranged to control an RDS of the code words and where the insertion means is arranged to insert a first sub group of code words representing a first section of a frame sync extension into the stream adjacent to the group of code words representing the frame sync body, and where a further insertion means is coupled to the input of the encoder, where the further insertion means is arranged to provide a frame sync balancing input word to the encoder for obtaining a second sub group of code words representing a second section of the frame sync extension at the output of the encoder, where the group of code words representing the frame sync extension comprises the first sub group of code words representing the first section of the frame sync extension and the second sub group of code words representing the second section of the frame sync extension, and where the frame sync balancing input word is chosen to cancel a disparity of the group of code words representing the frame sync body, characterized in that a length of the group of code words representing the frame sync

extension is variable.

16. Apparatus for storing data on a recording medium as claimed in claim 14 or 15,  
5 characterized in that the coder is a 17PP coder
17. Apparatus for storing data on a recording medium as claimed in claim 14 or 15,  
10 characterized in that the coder is an EFM coder
18. Apparatus for storing data on a recording medium as claimed in claim 14 or 15,  
15 characterized in that the coder is an EFM+ coder
- 15 19. Apparatus for storing data on a recording medium as claimed in claim 14, 15 or 16,  
characterized in that a group of code words representing the frame sync extension in the  
stream is chosen from the following table:
- |    | first section of frame sync extension |
|----|---------------------------------------|
| 20 | FS0 000 001 000 001 001 000           |
|    | FS1 010 010 001 000 001 001           |
|    | FS2 101 000 001 000 101 000           |
|    | FS3 100 001 000 010 001 001           |
|    | FS4 000 100 010 100 001 001           |
| 25 | FS5 001 001 001 000 101 001           |
|    | FS6 010 000 001 000 010 010           |
|    | FS7 100 101                           |
|    | FS8 101 010                           |
- 30 20. Apparatus for storing data on a recording medium as claimed in claim 15 or 16,  
characterized in that the first sub group of code words representing the first section of the  
frame sync extension in the stream is chosen from the following table:

Frame Sync sub ID

	FS0	000 001
	FS1	010 010
	FS2	101 000
	FS3	100 001
5	FS4	000 100
	FS5	001 001
	FS6	010 000
	FS7	100 101
	FS8	101 010

10 and that the frame sync balancing input word is chosen from the following table:

frame sync balancing input word

	FS0	11 10 10 11
	FS1	10 11 10 10
	FS2	10 11 11 11
15	FS3	11 01 10 10
	FS4	00 11 10 10
	FS5	10 11 11 10
	FS6	10 11 01 01
	FS7	none
20	FS8	none